

# **DEVICE FOR CONTROLLING A FREQUENCY RESPONSE BY SCALING AN IMPEDANCE**

## **ABSTRACT OF THE DISCLOSURE**

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Provided is a device for controlling a frequency response by scaling an impedance. The device includes a filter and a duty ratio controller. The filter generates an output signal after removing a frequency from an input signal, and comprises a first impedance component and a switch. The switch, which is serially  
10 connected to the first impedance component, is switched on or off in response to a duty-controlled clock signal. The duty ratio controller receives a clock signal, controls a duty ratio of the clock signal, and generates the duty-controlled clock signal. The duty ratio controller comprises a flip-flop, which has a clock terminal that receives the clock signal, and a reset terminal, which receives a delayed signal obtained after  
15 delaying the clock signal by a time delay. The duty ratio controller further comprises a delay component that receives the clock signal, generates the delayed signal, and controls the time delay in response to a duty control signal.